NAVAL WAR COLLEGE
Newport, RI

Time-Critical-Targeting for the CINC

by

Alfred R. Turner
LCDR USN

Seminar 5

A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Maritime Operations.

The contents of this paper reflect my own personnel views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

Signature:_____

5 February 2001

Advisor:
James Fitzsimonds, Captain, USN

Seminar Moderators:
Arnold Bray, Colonel, USA
Chet Helms, Captain, USN

5 Security Classification This Page

REPORT DOCUMENTATION PAGE

1. Report Security Classification: UNCLASSIFIED	
2. Security Classification Authority:	
3. Declassification/Downgrading Schedule:	
4. Distribution/Availability of Report: DISTRIBUTION STATEMENT A: APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.	
5. Name of Performing Organization: JOINT MILITARY OPERATIONS DEPARTMENT	
6. Office Symbol: C	**7. Address:** NAVAL WAR COLLEGE 686 CUSHING ROAD NEWPORT, RI 02841-1207
8. Title (Include Security Classification): Time-Critical-Targeting for the CINC (U)	
9. Personal Authors: Alfred R. Turner, LCDR, USN	
10.Type of Report: FINAL	**11. Date of Report:** 5 February 2001
12.Page Count: 30 Advisor: CAPT Fitzsimonds	
13.Supplementary Notation: A paper submitted to the Faculty of the NWC in partial satisfaction of the requirements of the JMO Department. The contents of this paper reflect my own personal views and are not necessarily endorsed by the NWC or the Department of the Navy.	
14. Ten key words that relate to your paper: time-critical-targeting, time-sensitive-targeting, targeting, rapid targeting, flexible targeting, mobile targeting, intelligence, surveillance, reconnaissance, command and control, Allied Force	

15.Abstract: Since Desert Storm, the U.S. military has struggled with attacking mobile land targets accurately beyond the immediate battle line. To accomplish this requires synchronized and overlapping execution of three operational functions: intelligence, surveillance, and reconnaissance (ISR); command and control (C2); and strike execution (fires), lashed together by communications. Improving the time-critical-targeting (TCT) process, including doctrine and organizations, using existing technology and forces can yield substantial near-term TCT improvements. Each CINC should develop a plan, potentially under the auspices of a theater specific Concept Plan (CONPLAN), that establishes a theater specific targeting process, including TCT methods. A documented theater TCT process will facilitate training, develop relevant organizations and prepare theater forces and/or staffs for TCT before a conflict starts.

16.Distribution / Availability of Abstract:	**Unclassified**	**Same As Rpt**	**DTIC Users**
	X	X	X

17.Abstract Security Classification: UNCLASSIFIED	
18.Name of Responsible Individual: CHAIRMAN, JOINT MILITARY OPERATIONS DEPARTMENT	
19.Telephone: 841-6461	**20.Office Symbol:** C

Preface

Following Desert Storm and the failure to attack Iraq's mobile SCUDs successfully, mobile targeting became vogue. DOD spent money, debated methodologies and created some systems and tools. However, as time passed and lessons unlearned faded, mobile targeting became just another concept fighting for scarce defense dollars. Besides, attacking SCUDs was not a high priority for most military leaders. The Army did not see SCUDs as a threat to their operations, the Air Force was concerned with strategic centers of gravity (COGs) and the Navy just wanted to stay in the aviation business.

The Air Force's focus on strategic COGs also tended to exclude other (non-SCUD) mobile targets. Why destroy dangerous SAM sites and fielded forces when one can destroy the air defense system and military infrastructure supporting them? Attacking individual high pay off targets became the watchword again. Attacking mobile targets put aircrew at increased risk and/or increased the risk of wasted sorties or weapons use--heaven knows you do not want that. The theory was that by attacking a limited number of high value targets with precise weapons, you could achieve grand objectives (air power theory 101). The search for silver bullets and short cuts danced in the imaginations of leaders throughout the Pentagon.

So targeting doctrine reverted to theories developed before WWII and expressed in various cold war training manuals. Attack the fixed targets with scientific methods and precisely constructed cycles, and U.S. air power will achieve decisive effects. Nice sentiment, but as recent operations show, going for the small nasty mobile targets is often the only way to achieve your strategic and operational objectives. At the very least, you can not afford to ignore the small nasty target. Unfortunately, U.S. targeting doctrine is designed to use a sledgehammer (albeit a precise one) against an enemy with first-world military-industrial vulnerabilities. However, for mobile targets, the military must do better than trying to kill a rabid rat with a WWF wrestler wielding a sledgehammer.

Table of Contents

Section		Page
	List of Illustrations.....	ii
	Executive Summary.....	iii
I.	Introduction.....	1
II.	Current Process.....	2
III.	Success.....	6
IV.	Challenges.....	8
V.	The Way Ahead.....	12
VI.	Conclusion.....	17

List of Illustrations

		Page
Figure 1.	Time-Critical-Targeting Process.....	2
Figure 2.	Allied Force Fielded Forces Battle Damage Assessment...	4
Figure 3.	Developing a CINC TCT Process.....	12
Figure 4.	Time-Critical-Targeting Matrix.....	17

Executive Summary

Since Desert Storm, the U.S. military has struggled with attacking mobile land targets accurately beyond the immediate battle line. To accomplish this requires synchronized and overlapping execution of three operational functions: intelligence, surveillance, and reconnaissance (ISR); command and control (C2); and strike execution (fires), lashed together by communications. Improving the time-critical-targeting (TCT) process using existing technology and forces can yield substantial near-term TCT improvements.

TCT requires ISR to detect, locate and identify mobile target(s), using collection, analysis, collaboration, and dissemination methods. The decision-maker, supported by a C4ISR node, decides whether to attack the target. Weapon platforms (from air, sea or land) then execute the attack. ISR completes the process by assessing the result of the attack(s).

This process must happen within hours. Currently, the U.S. capability to conduct TCT is inconsistent. While notable TCT successes occurred in Allied Force and other operations, TCT challenges outweigh the accomplishments. Rather than using an established TCT process, the U.S. military develops an operation specific process on the fly—and usually in the midst of conflict. No comprehensive TCT plan exists, and that is the problem.

Each CINC should develop a plan, potentially under the auspices of a theater specific Concept Plan (CONPLAN), that establishes a theater targeting process, including TCT methods. A documented theater TCT process will facilitate training, develop relevant organizations and prepare theater forces and/or staffs for TCT before a conflict starts.

I. Introduction:

Since Desert Storm, the U.S. military has struggled with attacking mobile land targets beyond the immediate battle line. The discord continues with the Joint community's inability to agree upon terms encompassing mobile targets and dynamic targeting.

- JP 3-60 (preliminary coordination) Time-Sensitive Targets: "A TST is a lucrative, fleeting, air-, land-, or sea-based target of such high priority to friendly forces that the joint force commander (JFC) designates it as requiring immediate response."[1] This is the only approved Joint definition.
- JP 3-60 (preliminary coordination) Time-Sensitive Surface Targets: "TSSTs are defined as those targets, either mobile or stationary, physically located on the surface of the earth (land or sea), requiring immediate response because they pose (or will soon pose) a clear and present danger to friendly forces or are highly lucrative, fleeting targets of opportunity."[2]
- AC2ISRC [USAF] 401-98 (draft) Time-Critical Targets: "...TCTs are time sensitive targets with an extremely limited window of vulnerability or opportunity, the attack of which is critical to ensure successful execution of the JFC's operations."[3]

TSTs, TSSTs or TCTs are different from other targets only in that time is the critical factor for success. TSTs and TCTs include a wide spectrum of targets, including fixed facilities or moveable equipment on land, sea or air. Moveable equipment on land ranges from the relocatable (e.g. strategic surface-to-air missile battery) to the mobile variety (e.g., tank). Relocatable targets take longer to pack up, move and set up than mobile targets. Furthermore, mobile targets may be cooperative or uncooperative. A mobile target that exposes itself to friendly intelligence sources is cooperative. Targeting relocatable or mobile equipment on land, particularly equipment that is uncooperative and beyond the immediate battle line (deep battle or air interdiction), is the current challenge for U.S. forces.[a]

---

[a] "TCT" will be used throughout this paper to describe targets that are relocatable/mobile and where time is the key to successful attack. "Mobile" will refer to both relocatable and mobile targets.

By its own admission, "The Department [of Defense] needs to meet the difficult challenge of rapidly targeting enemy forces and systems that move and hide frequently."[4] The answer to this requires the military to develop a process to get inside the enemy's decision timeline and successfully attack multiple mobile targets before they move. To accomplish this requires synchronized and overlapping execution of three operational functions: intelligence, surveillance, and reconnaissance (ISR); command and control (C2); and strike execution (fires), lashed together by communications (Figure 1).[5] Within these functions, TCT consists roughly of six steps: detect, locate, identify, decide, execute (attack) and assess.[6] ISR handles "detect, locate, identify and assess;" C2 is responsible for "decide" and strike assets execute "attack." While improving technology is critical to this process, the U.S. military often treats scientific solutions as a panacea. Improving the TCT process using existing technology and forces can yield substantial near-term TCT improvements.

II. Current Process:

TCT is an intelligence intensive process. The U.S. ISR system employs available collection, targeting, dissemination and assessment resources in support of a Combined Air Operations Center (CAOC) or Joint Air Operations Center (JAOC).[b] The process starts with the tasking of national collection systems such as satellites and theater sensors such as UAVs, RC-135, JSTARS, EP-3, U-2, Iron Clad and F-14 TARPS. Signals intelligence (SIGINT), and to a lesser extent human intelligence (HUMINT) and other sources, can provide indications of enemy activity. These indications should in turn

[b] CAOC and JAOC are inter-changeable terms for this paper. The C4ISR function for a CAOC is the same as that of a JAOC or AOC.

prompt tasking of imagery systems or strike assets to positively identify (PID) mobile targets and locations. The theater commander (CINC) is responsible for managing theater collection assets, with the Joint Forces Air Component Commander (JFACC) coordinating most tasking via the three-day air tasking order (ATO) process. The CINC retains the authority to request national collection support. This U.S. system provided the majority of the collection support to Operation Allied Force (OAF) TCT.

Based on analysis of data collected, JAOC intelligence personnel produce intelligence preparation of the battlefield (IPB). IPB should focus collection and strike planning on likely mobile equipment operating areas. Individual target analysis consists of PIDing the target and deriving geographic coordinates. During OAF, the CAOC intelligence section and theater intelligence organizations conducted traditional air-centric IPB.[7]

Analysis from national and theater intelligence centers feeds the JAOC intelligence staff. Theater sensors add new and sometime duplicative raw or semi-finished intelligence. Based on these feeds, JAOC intelligence personnel are then required to provide an understandable and timely picture of the situation and targeting data on individual TCTs to decision-makers and remote weapons platforms. For example, in OAF the CAOC was at the virtual center of a "federated" intelligence network that reached into the national intelligence structure and directly over Kosovo.

The "federated" intelligence network also provides an assessment, or battle damage assessment (BDA), of success or failure of strikes versus mobile targets. While supported by all intelligence sources, imagery based sensors are the most widely used to assess success or failure. Although the BDA process produces numbers and percentages

to assist in determining success or failure, the design of the system is to assess effects against strategic, operational and tactical objectives.[8] BDA of mobile targets in OAF, which focused on numbers of equipment destroyed, remain in dispute (Figure 2).[9]

Central to TCT is the C2 structure, including command guidance, JAOC organization and communications that direct and link the process. The CINC and the Joint Task Force commander (CJTF) provide guidance that will determine whether the main effort of deep operations attacks "strategic" level facilities or mobile forces at the operational or tactical level. In OAF, SACEUR split NATO efforts between attacking "strategic" targets in Serbia and "tactical" targets in Kosovo and southern Serbia.[10] Operating under the principle of centralized control and decentralized execution, the JFACC retains or delegates authority to execute attacks against mobile targets. For example, during OAF execution authority for mobile targets remained primarily with the Combined Forces Air Component Commander (CFACC), but rested sometimes with individual units or platforms.[c]

Supporting the JFACC, the JAOC is typically an ad hoc organization formed around a U.S. Air Force core element from a numbered Air Force staff. As the JFACC forms the JAOC, personnel from the USAF and other services engaged in air operations augment the JAOC staff and form liaison elements to other component staffs. The JAOC ATO process, planned and executed by the combat plans and operations divisions, is the mechanism for planning and executing TCT. For OAF the CAOC staff swelled from 400 to 1300.[11] Although the staff included members of all the U.S. services and engaged NATO forces, the USAF planned and directed most NATO air operations.[12]

Properly managed, large bandwidth and powerful information systems provide the JFACC and the JAOC staff the means to receive and correlate intelligence and direct strike operations. According to a DOD report to Congress, "Successful strikes against time-sensitive targets [i.e., TCTs] require a rapid exchange of precision target data and continuous [or timely] precision updates from sensor-to-shooter until the target is destroyed."[13] Satellite (SATCOM) and land-lines allow senior commanders and staffs to use video teleconferencing (VTC), email, phone calls, and web-based technology for intelligence, command and pre-planned strike coordination. The JAOC uses SATCOM, data links and voice radio to direct time-critical strikes against mobile targets. For example, OAF participants used all of these means, although voice communications was the primary link between the CAOC and airborne C2 and weapon platforms for TCT.

Strike operations versus small mobile targets by air/sea/land based weapon platforms tasked through the ATO process completes the TCT functions. Mobile targets include enemy air defense forces (e.g., SAMs, aircraft on the ground and EW radars), fielded forces (e.g., tanks, APCs and artillery), coast defense forces (e.g., CDCMs); C4 elements (e.g., communications vans and command posts) and strategic forces (e.g. SRBMs). Some of these, such as SRBMs or SAMs, are individually high value targets. Others, such as fielded forces, may be high priority when attacked en masse over a short time span. TCT weapons include primarily man-in-the-loop precision-guided munitions (PGMs) and global positioning system (GPS) guided weapons. In OAF NATO attacked two types of mobile targets, air defense and fielded forces. U.S. forces preferred and

[c] JFACC and CFACC are inter-changeable terms for this paper. The air component commander function of a CFACC is the same as that of a JFACC.

most often used man-in-the-loop PGMs, although they also employed GPS guided weapons such as TLAM and JSOW against mobile air-defense equipment.

The JAOC tasks units via the ATO to employ platforms to deliver these weapons versus mobile targets. The ATO allocates particular units or platforms to prepare for TCT missions, and during a particular ATO day, JAOC combat operations will assign platforms to execute strikes against specific mobile targets. Alternately, based on JFACC guidance, weapons platforms assigned by the ATO to TCT missions may have the authority to attack PIDed mobile targets. In OAF, the CAOC used the standard three-day ATO cycle and combat operations division tasking to manage TCT.

Weapon platforms conduct TCT under a variety of operational planning, tactical and system limitations. Operationally, U.S. air planners follow roughly a deliberate process, first attacking enemy air defenses, then critical fixed targets and last smaller mobile targets. Such was the case in OAF. Tactically, aircraft are generally restricted to medium to high altitude and away from roads to avoid threats, and if employing man-in-the-loop weapons, they are required to PID the mobile target before weapons release. These restrictions, exacerbated by weather and collateral damage concerns, existed for weapon employers in OAF.

III. Successes:

Despite problems surrounding TCT, some of the procedures, concepts and technology used to attack mobile targets during OAF could make up parts of an overall TCT process or system. OAF illustrated the U.S. military's ability to degrade enemy mobile equipment in spite of poor weather, broken terrain and enemy camouflage, concealment and deception (CC&D).

First, OAF established that the U.S. continues to improve the speed and accuracy of ISR support to TCT. NATO focused a high concentration of ISR collection assets on the TCT problem, making this the most robust ISR effort to date.[14] Additionally, the operation generated new JSTARS data fusion concepts, used UAVs as remote forward air controller-airborne (FAC-As) to assist TCT attack and BDA, employed digital tactical reconnaissance and demonstrated U-2 data processing "reach back" to CONUS.[15] Using intelligence gathered by these and other collection assets, the CAOC improved timelines for identifying emerging targets and providing intelligence to strike assets.[16] Using systems like F-14 Fast Tactical Imagery (FTI), the U.S. demonstrated the capability to provide finished timely strike intelligence to airborne aircraft.[17] Furthermore, national and theater intelligence analysts supported CAOC target development and BDA through the highly successful "federated" intelligence structure developed in the European Command during the 1990's.[18]

OAF demonstrated the current C2 system's capability to facilitate flexible coordination from the highest command levels down to tactical units. Despite initial confusion on targeting priorities, SACEUR guidance to attack fielded forces eventually drove the operation. Although the CAOC was the approving authority for most air strikes, the CFACC delegated some execution authority to airborne C2 aircraft. Examples of this included using EC-130 Airborne Battlefield Command, Control and Communications (ABCCC) aircraft, and FAC-As to assist in PID and authorizing strikes versus mobile targets. Furthermore, the CAOC expanded successfully to meet wartime needs, integrating twice the original number of personnel. Although not optimal, current communications architecture allowed the CAOC to coordinate TCT efforts over a wide

area of operation and supported the flow of intelligence within the federated intelligence structure.

Lastly, OAF showed the U.S. military capability to execute time-critical strike versus mobile targets. The current process facilitated NATO attacks on several hundred small mobile targets without loss of a single NATO aircrew. Successful TLAM strikes against aircraft on the ground and other air defense assets, and several JSOW strikes against SAMs and EW radars, demonstrated GPS weapon capability versus mobile targets. Also, the CAOC built flexibility into the current ATO system by allocating a number of sorties each day to attacking fielded forces and other mobile systems. Lastly, to assist in target PID, "engagement altitudes for both airborne forward air controllers and striking assets were lowered as Operation Allied Force progressed."[19]

IV. Challenges:

The U.S. military in the 1990's has faced numerous TCT tests, although OAF was particularly challenging. Adversaries and potential enemies, outclassed by the U.S. military, avoid massing their forces, employ CC&D, exploit U.S. fears of collateral damage and casualties and use mobility to retain a force in being. In OAF, "...the Serbs frequently dispersed their air defenses and fielded forces from one location to another, [and] it was difficult for NATO [i.e., the U.S.] to find, fix, and destroy them."[20] The Joint Community is attempting to resolve some of the TCT shortfall with a renewed emphasis on publishing Joint Pubs 3-60 and 2-01.1.[21] However, unresolved inter-service disputes over targeting methodology threaten to leave these documents unpublished or published with inadequate generalities. There is no accepted joint TCT process, and Joint doctrine is unlikely to provide one. Without a process, theater forces are unable to conduct robust

TCT training. Without a documented process, organization or training, the CINC is unprepared to conduct TCT at the start of a conflict and will be only partially effective during a conflict.

ISR, centered on the JAOC J2, is unprepared to support TCT versus mobile targets. First, as noted during OAF, there are too few low-density/high-demand collection assets, such as U-2, Iron Clad, RC-135, and other special mission aircraft.[22] Theater assets are unable to maintain necessary all-source collection to support TCT over a long time-period, and national collection response times are too slow. OAF identified the need for effective and robust collection management to simultaneously detect and track mobile targets.[23] Additionally, the system to satisfy national collection requirements passes through too many decision-makers, rarely responding to tasking within 24-hours. Lastly, the three-day ATO cycle driving theater collection is too inflexible, focusing assets on one to three day old targets of interest.

Detailed "intelligence preparation of the battlefield" (IPB), the critical tool that can assist TCT collection management, target identification and strike operations, is often deficient. Navy and Air Force intelligence personnel at the JAOC typically lack the understanding of ground operations to conduct TCT IPB, and Army intelligence presence in the JAOC is usually insufficient to correct this deficiency. When collection assets discover possible mobile targets, imagery analysts often lack the training to PID the targets--particularly when enemy equipment employs CC&D or in areas of high collateral damage risk. Furthermore, imagery analysts generally lack the experience and training necessary to exploit difficult to analyze all weather radar sensors to PID targets. As one

military writer noted, "US target analysts misinterpreted the information furnished them [during OAF]. Processing information is one thing, interpreting it is an art."[24]

While the federated intelligence structure supporting TCT and other targeting analysis is theoretically sound, the system breaks down under pressure or if not adequately exercised in peacetime. In the absence of strict theater CINC guidance, there is a tendency among military and civilian intelligence commands and agencies to stove pipe intelligence directly to the operational commander. The result is intelligence overload and missed TCT opportunities.

As seen in OAF, the U.S. military BDA process has difficulty in tracking numbers of mobile targets destroyed and determining the effect of the destruction on the enemy. Intelligence analysts and decision-makers focus on the numbers and fail to pay attention to the target system analysis phase (third phase BDA) of the BDA process, which is intended to determine overall effects on the enemy relative to U.S. objectives.

Inadequate C2 doctrine and organizations further inhibit TCT versus mobile targets. First, commander's guidance either fails to accord mobile targets a high enough importance early in a conflict, or disagreements between commanders on priorities creates ambiguities down the chain-of-command. During OAF, the public disagreement between SACEUR and the CFACC on targeting priorities slowed the TCT process. The JFACC's retention of execution authority further slows the TCT process. During OAF, the CAOC appeared to mix centralized and decentralized execution. For example, ABCCC aircraft possessed some attack decision-making authority but more often served as a relay between the CAOC and strike aircraft.[25] The time wasted in passing

information from ABCCC aircraft to the CAOC and then back to strike aircraft inhibited TCT.[26]

Further slowing the TCT process is the JAOC's status as an ad hoc organization created for an operation. The temporary nature of the organization means the members do not work or train together before the onset of a crisis. This results in days to weeks of delay in becoming proficient at TCT operations. Furthermore, the failure to integrate all services into the JAOC leaves non-USAF operational concepts underrepresented.

Although bandwidth to support C2 for TCT has expanded dramatically since Desert Storm, the military fails to manage communication media properly. During OAF, "people had difficulty identifying and locating real-time sensitive data."[27] The problem is too few procedures to manage the high volume of frequently duplicative email, VTCs, message traffic and voice communications. Additionally, the general failure of the services to insure communications interoperability or integration results in further delays in passing TCT intelligence from sensor to weapon employer.

The failure of ISR and C2 to prepare for TCT exacerbates the inability of strike assets to adjust to TCT. First, U.S. military doctrine and planning documents often assume enemy mobile equipment is always on the move. Thus, the requirement for attacking these targets is "near-real-time" (NRT).[28] However, mobile equipment, such as a SAM or a tank, is unlikely to complete a routine move more than once or twice a day.[29] Thus, NRT probably overstates the current TCT requirement.

Conversely, the ATO process utilized to manage execution is too slow and inflexible to support TCT. The ATO process attempts to plan aircraft allocation three

days in advance of execution. Once planned, it is difficult to move forces between missions during the 24-hour ATO execution day.

Current operation planning and tactics magnify TCT problems. The U.S. military is predictable--destroy/roll back the enemy air-defense system, attack numerous fixed targets and then, maybe, attack fielded forces and surviving mobile air defense systems. For example, in OAF NATO did not attack Serb ground forces directly until two weeks into the operation.[30] According to one writer on military affairs, "NATO is regarded as having made a slow start, particularly through a lack of mass and shock force in the initial waves of bombing."[31] Tactics then complicate the problem of attacking a prepared enemy. Aircraft operating at high altitude and away from roads to avoid threats make mobile target PID difficult and take aircraft away from mobile equipment locations.

V. The Way Ahead:

With or without approved Joint doctrine, theater CINCs should refine their TCT process. According to proposed Joint doctrine, "Successful prosecution of TSSTs [i.e., TCTs] requires a well organized and well rehearsed process for sharing sensor data and targeting information, identifying suitable strike assets, obtaining mission approval, and rapidly deconflicting weapon employment."[32] Thus, each CINC should develop a plan, potentially under the auspices of a theater specific Concept Plan (CONPLAN), that establishes a theater targeting process, including TCT methods (Figure 3). Once the CINC establishes a CONPLAN with detailed intelligence, C2 and operations annexes, then he/she should further refine the process through the development of theater TTPs and SOPs. CINC mastery of this process is essential to preclude a single service TCT philosophy. Developing a CONPLAN, TTPs and SOPs in "peacetime" would allow

forces and/or staffs to train together, organize and further refine the TCT process. Thus, the theater would be prepared for TCT at the start of the conflict and effective throughout.

A CINC organized and trained ISR component will provide fast and more accurate support to TCT on the first day of operations. The overall system concept for a CINC ISR component should be roughly analogous to the Navy Ocean Surveillance Information System (OSIS). As noted by one Navy intelligence officer, "This all-source fusion approach that succeeded in tracking Cold War targets afloat should be reestablished to ensure streamlined tracking of time-critical targets ashore."[33] The CINC's theater intelligence center should implement this immediately by tracking and reporting on CINC identified priority mobile targets in high interest countries.

To support this system during conflict, the JFACC can overcome the lack or slow response time of collection by surging ISR assets on the first day of the operation. Alternately, synchronizing TCT operations to short theater and national collection surges within each ATO day offers less up front impact on the enemy but potentially greater sustainability over a long operation. The CINC should also press the services to ensure integration of collection processing. For example, ensuring the CV can receive a U-2 or UAV downlink would provide flexible processing of intelligence, potentially speeding up identification of mobile targets. Regarding collection management, build in dynamic tasking of theater collection assets during an ATO day. In particular, retasking imagery based theater collection assets based on other intelligence sources should be the norm--not the exception. Lastly, the CINC should delegate his authority in the national

collection process to the JFACC to help synchronize national collection with TCT operations.

Conduct Joint IPB to focus collection and targeting execution better for TCT. Incorporating Army IPB methods into what is essentially Navy and Air Force TCT would help provide a detailed view of the battlefield. Geography (including area delimitation), operating habits (recent and past), logistics support and intent all limit enemy equipment operating areas and movements. GALE (Generic Area Limitation Environment), a software package developed during Desert Storm (but largely forgotten), can support this analysis.[34] The CINC can also assist the process by ensuring imagery analysts assigned to joint intelligence billets train to identify ground targets, discern enemy CC&D and to interpret non-electro-optical imagery. Trained and experienced imagery analysts, working in concert with all-source analysts, increase the usefulness of all-weather sensors.

The federated intelligence structure supporting targeting and TCT is a strength that must continue to be improved. Without moving people, federated intelligence places potentially more analytic and imagery interpretation capability at the disposal of the CINC. The key to success is to exercise the process at least once a year—from national to the tactical level. As noted by DOD, exercises are one of the lynch pins to improving TCT timelines.[35]

The BDA process supporting TCT already exists. However, intelligence analysts should focus on enemy actions resulting from TCT rather than measuring numbers. The CINC, CJTF and JFACC must support this process, allowing for the free flow of raw intelligence and disseminating effects based assessments. General Clark's bottom line

after OAF, that NATO achieved it's objective by securing the withdrawal of Serb forces, captures the essence of what NATO should have assessed during the BDA process.[36]

However, probably the most critical components of successful TCT is for the CINC, CJTF and JFACC to provide clear commander's guidance and proper delegation of strike execution. As stated in JP 3-60, "The JFC's objectives and guidance set the basic procedural framework for components to expedite targeting TSSTs [i.e., TCT]."[37] If certain individual or massed mobile targets are an enemy strategic, operational or tactical center of gravity or critical strength, the CINC should make TCT a priority vis-à-vis fixed "strategic" targets. Furthermore, the CINC should decentralize and delegate authority for designating and attacking mobile targets to the lowest possible level. According to JP 3-60, "...the authority to engage should be delegated to the C2 node that has the best information or situational awareness to perform the mission and direct communications to weapons."[38] For example, a CVN or a capable strike platform can act as principle authority on designating TCTs. These C2 nodes would become more effective if the JFACC gave each node responsibility for certain geographic areas of TCT operations.

Organize the JAOC to conduct TCT. This should be the focus of an integrated function of the JAOC's targeting responsibilities. Due to increased networking and the federated intelligence structure, the CJTF supported by theater intelligence centers and national intelligence agencies can conduct most of the targeting versus fixed facilities. Two alternatives for organizing TCT centers include: (1) Retain strategic targeting and air operations at the JTF and designate a separate C2 node as responsible for TCT, or (2) designate one or more tactical C2 entities as TCT nodes. For example, a CVN would

make a good TCT C4ISR node. If the commander creates more than one TCT node, divide airspace into "kill boxes" to ensure deconfliction.[39] Furthermore, both the JAOC and TCT nodes should be Joint in practice with all services providing personnel, whether their forces are engaged in the operation or not. Lastly, the CINC should build a deployable theater JAOC as part of his theater CONPLAN. As noted by DOD, "The development of established expeditionary air operations centers with supporting resources and manpower will allow the military to create CAOCs [or JAOCs] that can be tailored to the crisis at hand and deployed quickly...greater cohesion and training of an expeditionary CAOC will enable it to tighten the operational decision loop. Such units will be able to develop and standardize tactics, techniques and procedures..."[40]

Develop procedures for the multitude of communications systems, media and information management tools as part of an overall theater targeting/TCT CONPLAN. The CINC can also ensure components work out non-technological communications interoperability shortfalls during CONPLAN development. The CONPLAN should also standardize procedures for using existing means to provide timely imagery (e.g., FTI and PRISM) and target coordinates (e.g., voice and JTIDS DL) to airborne strike aircraft.[41]

Plan time-critical strike operations to be flexible and to take the initiative. Since mobile equipment is typically stationary for most of time, it is vulnerable to the mix of U.S. capabilities--ranging from man-in-the-loop weapons to GPS guided weapons. Expand the enemy window of vulnerability by incorporating tactical deception into TCT operations. Use knowledge of enemy indications and warning capabilities to spoof and desensitize enemy forces and/or force them to react to friendly operations.[42]

Modify the ATO process by compressing the cycle times, focusing on same-day target identification and execution. To achieve mass effects early in the conflict, focus the preponderance of the force on mobile targets. Rather than systematically attacking purported "strategic targets" using a three-day ATO process, aircraft and other weapons platforms plan to strike particular areas and/or against certain types of targets based on IPB. Allocate platforms or weapons to particular mobile target sets or operating areas (e.g. kill boxes) the day before execution, and assign specific mobile targets on the day of or during strike execution windows.

The JFACC should use the preponderance of ISR and strike assets versus TCTs on the first day of strike operations.[43] Seize the initiative when the enemy is least ready and bypass the air-defense "roll-back" phase. An A-10 pilot during OAF noted, "When we initially went into country we found military vehicles on the roads, we attacked them with precision-guided missions, bombs, bullets, and within three days we drove them off the roads."[44] The risk in surging ISR and strike assets is a lack of sustainability and air superiority. One way to mitigate the risk is to time ISR and strike surge days to weather. For example, in Kosovo, only approximately 50 percent of the days were good strike weather days.[45] Maintenance and crew stand down days could occur during poor weather. Coordinating SEAD support to achieve local air superiority further mitigates risks. Tactically, the U.S. military should concentrate attacks along roads, and just like late in OAF, execute attacks from lower altitudes.

VI. Conclusion:

The intent of these recommendations is to provide the CINC with an overview of some TCT improvements to facilitate the development of a CONPLAN for a

comprehensive system to attack mobile targets (Figure 4). Unable to resolve differences in service philosophies on how to conduct TCT, national level targeting organizations revert to fixing incremental problems. Gradual improvements are necessary but insufficient. When a conflict starts, the CINC and the CJTF need a TCT process and forces ready to attack mobile surface targets.

TCT is rudimentary network-centric warfare (NCW). However, NCW requires a balance between advances in technology, organizations and doctrine. Although TCT will benefit from further advances in technology (e.g., new sensors and sensor/warhead integration), TCT will not benefit fully from these improvements unless organizations and doctrine exist to use technology effectively. The CINC should take the reigns. Complementary to the national effort, the CINC should prepare theater organizations and plans to improve future TCT operations. If the theater waits for the national community to solve it, prepare for the frustrations of Desert Storm and Allied Force--again.

---

[1] Joint Chiefs of Staff, Doctrine for Joint Targeting, Preliminary Coordination Joint Pub 3-60 (Washington, DC: 6 June 2000), I-4.

[2] Ibid, I-5.

[3] Major General Gerald F. Perryman, Defeating Theater Time Critical Targets, Final Draft FSRD AC2ISRC (USAF) 401-98, (Langley AFB, VA: 11 January 2000), 5.

[4] U.S. Department of Defense, Report to Congress: Kosovo/Operation Allied Force After-Action Report, (Washington, DC: 31 January, 2000), 56.

[5] Perryman, 6.

[6] Joint Chiefs of Staff, Doctrine for Joint Targeting, B-3.

[7] Based on author's observation of multiple OAF IPB products. These resources, purported to show mobile air defense or fielded force operating areas, tended to be too general to adequately support TCT. Furthermore, specific analytic elements (e.g., geographic delimitation or accounting for pre-OAF Serb operating patterns) were missing from IPB products.

[8] Based on the author's personal experience while working BDA issues for the Joint Staff J2 Deputy Directorate of Targets (JS J2T). The focus on target system effects against objectives is known as Phase 3 BDA.

[9] John Barry and Evan Thomas, "The Kosovo Cover-Up," Newsweek, 15 (May 2000), 23.

[10] General Wesley K. Clark and Brigadier General John Corley, "Press Conference on the Kosovo Strike Assessment," 16 September 1999, <http://www.eucom.mil/operations/af/nato/1999/meabriefing.htm> (05 January 2001), 1 – 2.

[11] U.S. Department of Defense, Report to Congress: Kosovo/Operation Allied Force After-Action Report, 45.

[12] Based on multiple sources and author's personal experiences in dealing with the CAOC Vicenza (1994-1998) and other JAOCs. Since a USAF officer is usually the JFACC/CFACC, the USAF writes most AOC doctrine and USAF training integrates the AOC concept, the USAF generally runs the JAOC/CAOC.

[13] Ibid, 49.

[14] General Wesley K. Clark and Brigadier General John Corley, "Press Conference on the Kosovo Strike Assessment," 5.

[15] U.S. Department of Defense, Report to Congress: Kosovo/Operation Allied Force After-Action Report, 55-57.

[16] Ibid, 58.

[17] Anthony H. Cordesman, The Lessons and Non-Lessons of the Air and Missile War in Kosovo, Center for Strategic and International Studies, (Washington, DC: 20 July, 1999), 194. Also, author's personal experience with using FTI to support TCT.

[18] U.S. Department of Defense, Report to Congress: Kosovo/Operation Allied Force After-Action Report, 53.

[19] Ibid, 66.

[20] Ibid, 55.

[21] Information based on author's observation and experience in the Joint targeting community. The subject documents have existed in draft form for nearly a decade.

[22] U.S. Department of Defense, Report to Congress: Kosovo/Operation Allied Force After-Action Report, 52.

[23] Ibid.

[24] Lieutenant Colonel Timothy L. Thomas, "Kosovo and the Current Myth of Information Superiority," Parameters, 30 (Spring 2000), 16.

[25] Robert Wall, "New ABCCC Tactics Used in NATO Air Strikes," Aviation Week & Space Technology, 26 (April 1999), 32.

[26] Thomas, 15.

[27] U.S. Department of Defense, Report to Congress: Kosovo/Operation Allied Force After-Action Report, 48.

[28] U.S. Department of Defense, Report to Congress: Kosovo/Operation Allied Force After-Action Report, 95-96.

[29] Based on author's personal experience while providing support to Operations Desert Storm, Deny Flight, Desert Strike and Southern Watch.

[30] Robert Wall, "NATO Shifts Tactics to Attack Ground Forces," Aviation Week & Space Technology, 12 (April 1999), 22.

[31] Paul Mann, "Belgrade Called Victor In War's First Phase," Aviation Week & Space Technology, 26 (April 1999), 28.

[32] Joint Chiefs of Staff, Doctrine for Joint Targeting, III-5.

[33] LCDR Dan Shanower, "Naval Intelligence Must Focus on Time-Critical-Targeting," U.S. Naval Institute Proceedings, (October 2000), 102. During the Cold War, OSIS consisted of all-source intelligence sensors feeding ashore intelligence nodes, which in turn produced timely intelligence on the location and actions of the Soviet Navy. In the event of war, one of the intents of the system was to provide friendly units with cueing data on enemy ships and aircraft. An analogous system to support TCT would require generating more finite targeting data and the inclusion of certain ships and aircraft as C4ISR nodes in the system.

[34] GALE was designed originally to assist analysts in tracking mobile targets. The problem the U.S. military had in tracking SCUDs during Desert Storm was one of the original justifications for the software. While that intent appears to have fallen aside, currently electronic intelligence analysts use a version of GALE for electronic order-of-battle analysis. Of interest, the author last saw a fully functional GALE

software package resident on a computer in the basement of the Pentagon. The resident expert in the use of GALE for tracking mobile targets had moved on to greener pastures.

[35] Ibid, 53.

[36] General Wesley K. Clark and Brigadier General John Corley, "Press Conference on the Kosovo Strike Assessment," 3.

[37] Joint Chiefs of Staff, Doctrine for Joint Targeting, III-4

[38] Ibid, B-1.

[39] Ibid, annex D.

[40] U.S. Department of Defense, Report to Congress: Kosovo/Operation Allied Force After-Action Report, 46 and 130.

[41] Based on author's experience. For example, there is no technological reason a CVN can not receive a U-2 down link. The services have purchased the necessary equipment, but installation and agreement on procedures for U-2/CVN interaction have yet to occur. Additionally, there is no technological reason a Navy battle group equipped with FTI can not send imagery to a USAF PRISM equipped aircraft, but there are no procedures to do so.

[42] Based on author's experience in OSW, U.S. forces can achieve tactical surprise against mobile targets by instituting simple deception plans and changes in operating patterns.

[43] Captain James Fitzsimonds, <fitzsimj@nwc.navy.mil> "Feedback," [email to author <turnera@nwc.navy.mil>] 16 January 2001.

[44] General Wesley K. Clark and Brigadier General John Corley, "Press Conference on the Kosovo Strike Assessment," 9.

[45] Ibid, 13.

Bibliography

Barry, John and Evan Thomas. "The Kosovo Cover-Up." Newsweek, 15 (May 2000): 23.

Clark, Wesley K. and John Corley, "Press Conference on the Kosovo Strike Assessment." 16 September 1999. <http://www.eucom.mil/operations/af/nato/1999/meabriefing.htm> [05 January 2001].

Cordesman, Anthony H. The Lessons and Non-Lessons of the Air and Missile War in Kosovo. Center for Strategic and International Studies. Washington, DC: 20 July, 1999.

Mann, Paul. "Belgrade Called Victor In War's First Phase." Aviation Week & Space Technology, 26 (April 1999): 28-30.

Perryman, Gerald F. Defeating Theater Time Critical Targets. Final Draft FSRD AC2ISRC (USAF) 401-98. Langley AFB, VA: 11 January 2000.

Shanower, Dan. "Naval Intelligence Must Focus on Time-Critical-Targeting." U.S. Naval Institute Proceedings, (October 2000): 102-103.

Thomas, Timothy L. "Kosovo and the Current Myth of Information Superiority." Parameters, 30 (Spring 2000): 13-29.

U.S. Department of Defense. Report to Congress: Kosovo/Operation Allied Force After-Action Report. Washington, DC: 31 January, 2000.

U.S. Joint Chiefs of Staff. Command and Control for Joint Air Operations. Joint Pub 3-56.1. Washington, DC: 14 November 1994.

_____. Joint Tactics, Techniques, and Procedures for Intelligence Support to Targeting. Final Coordination Joint Pub 2-01.1. Washington, DC: 29 January 1999.

_____. Joint Doctrine for Targeting. Preliminary Coordination Joint Pub 3-60. Washington, DC: 6 June, 2000.

Wall, Robert. "NATO Shifts Tactics to Attack Ground Forces." Aviation Week & Space Technology, 12 (April 1999): 22-24.

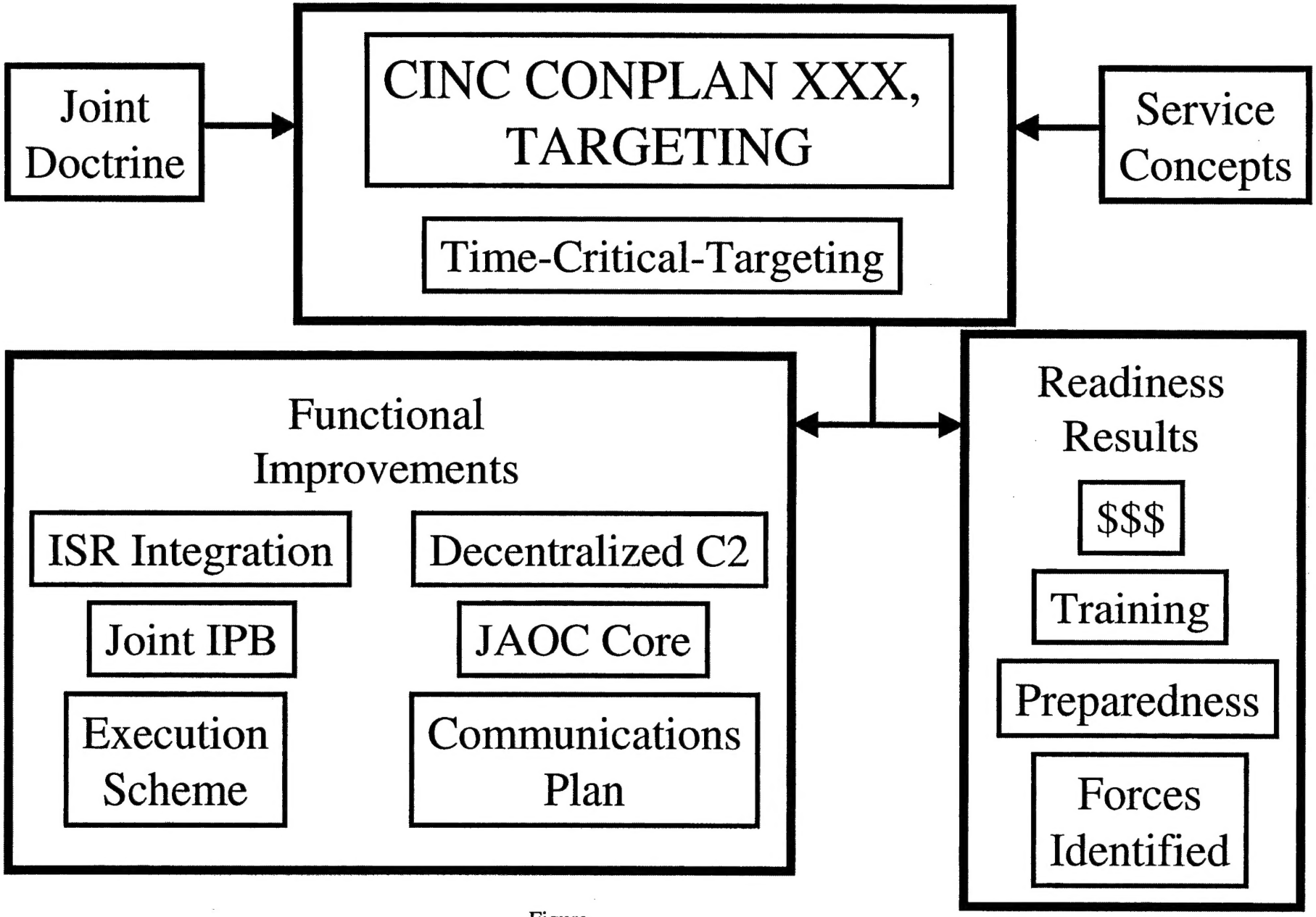
Wall, Robert. "New ABCCC Tactics Used in NATO Air Strikes." Aviation Week & Space Technology, 26 (April 1999): 32-33.

Time-Critical-Targeting

TCT Components	The Process	Successes - Allied Force	Challenges	Solutions
ISR	Detect, Locate, Identify & Assess	Faster & more accurate	Not fast & accurate enough	OSIS concept
Collection	*National/theater assets *Management - CINC/ATO	*Large number of assets *New assets & processes used	*Too few theater assets *Too little national/theather cover *National & theater (ATO) collection management slow	*Surge assets/Synch ops to ISR *Integrate processing *Dynamic theater asset retasking *Delegate national asset authority
Analysis	*IPB *Target PID/coordinates	*Better detect to attack times *Successful target PID	*Lack of Joint IPB *Imagery analysts PID problem	*Joint IPB *Imagery training/practice
Collaboration/ Dissemination	*Finished & raw intelligence input *Intelligence to DM & strike asset	*Federated intelligence *Timely intelligence to shooters	*Federated intelligence breaks down under stress *Stove pipes	*Incorporate into CONPLAN *Exercises/training *Improves IPB & IA numbers
BDA	*Targets hit (imagery) *Effects assessment	*Federated Intelligence & BDA	*Too much focus on number of targets hit	*Focus on effect versus target system
C2	Decide	Flexibility	Not flexible enough	Decentralize
Command/Guidance	*Commander's guidance - focus *Authority to attack targets	*Focused on fielded forces *Some delegation of authority	*Mobile targets ignored or low priority *Authority retained by JFACC or senior commander	*Clear guidance to attack TCTs *Delegate execution authority
Organization	*JAOC - adhoc & single service	*JAOC successfully expanded	*JAOC ad hoc nature = unpreparedness for TCT *JAOC single service = missing TCT skills	*Incorporate JAOC into CONPLAN *Organize JAOC for TCT *Subordinate TCT C4ISR nodes *Put "J" into JAOC
Communications	*Management *Pre-coordination & collaboration *Link to weapon employer	*Adequate support to federated intelligence, C2 & shooters	*Management failure = information confusion *Lack of service integration	*Formalize command & C2 to shooter procedures in CONPLAN
Strike/Execution	Execute Attack	Successful attacks	Not successful enough	Initiative/Aggressiveness
Target type	*Mobile targets - ADEF, forces, C4 & strategic *Weapons - man-in-the-loop & GPS	*Hundreds of mobile targets hit *Use of GPS weapons	*Overestimate target mobility = overstated NRT requirement	*Targets vulnerable to man-in-the-loop & GPS weapons *OPDEC
Allocation	*ATO - 3 day cycle	*Flexible use of ATO to allocate forces/weapons to TCT	*ATO process too slow/inflexible = too few TCT assets	*Focus ATO allocation to same day execution versus mobile forces
Ops Planning/Tactics/ Limitations	*ADEF rollback, strategic targets, mobile targets *Tactics - altitude *Weather & collateral damage	*Engagement altitudes lowered to assist PID	*Predictable & deliberate = too slow versus TCT *High altitude & LOC avoidance = target PID problem	*Attack mobile targets first *Go lower & attack along LOCs

Figure 4

Developing a CINC TCT Process



Figure

ALLIED FORCE FIELDED FORCES BATTLE DAMAGE ASSESSMENT

	Claimed Hits (Note 1)	**Official Hits, War End** (Note 2)	**MEA Team, Confirmed Hits** (Note 3)	**"Suppressed" USAF Report** (Note 4)
Tanks	181	120	93	14
APCs	317	220	153	18
Military Vehicles	800	?	339	?
Artillery/ Mortars	857	450	389	20

Author's note on effects

Of note, Anthony Cordesman relates that NATO only claimed to hit 15% of Serb Armor and APCs in Kosovo (Note 2, p. 15). Of more critical interest here is the U.S./NATO preoccupation with numbers of fielded forces hit. These numbers only constitute part of the first phase (physical damage) of the BDA process. At all times in the BDA process the bottom line should have assessed the impact hits on Serb fielded forces had on achieving the NATO objective of stopping or reversing ethnic cleansing.

Author's note on the process

Assessing hits on individual pieces of equipment is difficult and requires some type of imagery. The best source is cockpit or UAV video showing a weapon impact on the target. Theater assets (e.g., U-2, F-14 TARPS) and national assets possess some capability to assess hits on equipment. However, the small size of the target, combined with sensor standoff and resolution limitations, makes these assessments extremely challenging.

Note 1 Source: General Wesley K. Clark and Brigadier General John Corley, "Press Conference on the Kosovo Strike Assessment," 16 September 1999, <http://www.eucom.mil/operations/af/nato/1999/meabriefing.htm> (05 January 2001)

Note 2 Source: Anthony H. Cordesman, The Lessons and Non-Lessons of the Air and Missile War in Kosovo, Center for Strategic and International Studies, (Washington, DC: 20 July, 1999), 25.

Note 3 Source: General Wesley K. Clark and Brigadier General John Corley, "Press Conference on the Kosovo Strike Assessment," 16 September 1999, <http://www.eucom.mil/operations/af/nato/1999/meabriefing.htm> (05 January 2001)

Note 4 Source: John Barry and Evan Thomas, "The Kosovo Cover-Up," Newsweek, 15 (May 2000), 23.

Figure 2

Time-Critical-Targeting

National Intelligence Centers

Collaboration

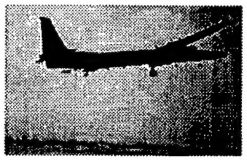
Theater Intelligence Center

Analysis
- IPB
- Target PID
- Coordinates
- BDA

Collection

Imagery
- National
- Theater

I&W
- SIGINT
- HUMINT
- Other



ISR

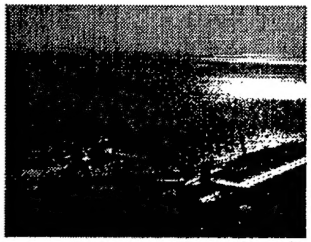
C2

Strike Authority
- CINC
- CJTF
- JFACC
- Other Component
- Unit

Organization
- JAOC
- CVN
- Other

Target

Target



Strike
- Man-in-the-loop wpn (Target PID)
- GPS wpn (coordinates)

Attack

Allocate
Assign

Mobile Target

Figure